

## CLAIMS

1. A modular system for connecting multiple voice and data communications devices located at a customer's premises to a T1 network, comprising:

5 a system chassis having a system backplane for receiving and connecting one or more system modules to the T1 network; and

one or more system modules removably connected to the system chassis for connecting one or more voice and data communications devices to the T1 network.

10 2. The system of claim 1, further comprising:

a power service unit connected to the system chassis for supplying power received from the network T1 to the one or more system modules.

3. The system of claim 2, further comprising:

15 a bank controller unit connected to the system chassis for controlling the power service unit and the one or more system modules.

4. The system of claim 3, wherein the power service unit supplies power to the one or more system modules using an ac power supply.

5. The system of claim 4, further comprising a battery backup system for  
20 supplying power to the system.

6. The system of claim 3, wherein the system chassis includes:

a network T1 connector for interfacing with the T1 network; and

the bank controller unit includes a T1 interface transceiver for connecting the bank controller unit to the T1 network.

7. The system of claim 6, wherein the system chassis further includes:

a fractional T1 connector for interfacing with the T1 network;

5 and

the bank controller unit includes a fractional T1 interface transceiver for connecting the bank controller unit to the T1 network.

8. The system of claim 7, wherein the system chassis still further includes:

10 a customer terminal interface connector for interfacing and controlling the system using a customer terminal; and

the bank controller unit includes a customer terminal interface circuit for connecting the bank controller unit to the customer terminal.

9. The system of claim 1, wherein the one or more system modules  
15 include dumb access modules, smart access modules, or a combination of both dumb and smart access modules.

10. The system of claim 9, wherein the one or more system modules include any combination of one or more of the following access modules:

an FXS/FXO access module;

20 a fractional T1 port;

a Nx56/64 access module;

a U-BRITE access module; or

a DDS access module.

11. The system of claim 10, wherein the FXS/FXO access module includes an automatic gain control circuit.

12. The system of claim 11, wherein the bank controller unit maintains  
5 performance information regarding the T1 network.

13. The system of claim 12, wherein the bank controller unit supports the following T1 formats:

Extended Superframe;

Superframe;

10 TR-08 with alarm-16; and

TR-08 with alarm-13.

14. The system of claim 13, wherein the bank controller unit provides network and fractional T1 control, access module control, alarm control, user interface control, and backplane control.

15 15. The system of claim 14, wherein the bank controller unit includes a field programmable logic array for providing clock generation, chip select, and backplane interface functions.

16. The system of claim 15, wherein the field programmable logic array is further used to interface the bank controller unit with each access module  
20 using a serial peripheral interface located on the system backplane, provide timing generation in local, loop, and external timing modes, provide dialtone and ringback tone generation, multiplex backplane data with fractional T1

data, generate bit clock and byte clock data, and generate chip selects for the T1 interface transceiver, fractional T1 interface transceiver, and front panel LEDs and switches located on the system chassis.

17. The system of claim 16, wherein the access modules include

5 a bus transceiver connected to a module signaling bus for interfacing input/output ports on the access modules with a backplane bus on the system backplane; and

a bus control logic unit coupled to a control bus portion of the backplane for interfacing control signals generated by a processor on the  
10 bank controller unit with processor-controlled circuit components on each access module;

18. The system of claim 17, wherein:

each access module is operable to communicate a module type unique identification code to the bank controller unit, and

15 the bank controller unit is responsive to the module type identification code and automatically configures the system to provide access to the network T1 and allocate bandwidth to the customer premises device connected to each access module.

19. The system of claim 18, wherein the bank controller unit controls  
20 signaling modes, transmit attenuation, receive attenuation, and 2-wire line impedance for each access module.

20. The system of claim 19, wherein the bank controller unit communicates with smart access modules to determine access module type, timeslot, configuration, status, and test information for the smart access modules.

5 21. A modular system for providing a functional connection between multiple customer premises communication devices and a T1 network data service terminating at the customer premises, the system comprising:

a. a system chassis having a bank of module slots, each slot adapted for receiving one of a plurality of removable system modules such  
10 that the system modules can be inserted in and removed from the module slots from a front portion of the chassis;

b. the system chassis further comprising a system backplane adapted for electrically connecting to the system module connectors on a rear portion of the system modules; and

15 c. the system modules including a plurality of access modules operable to provide a functional interface between the T1 service and different types of the customer premises communications devices, including both voice and data devices, the access modules used in the system being selected by the customer to correspond to the types of customer  
20 premises communications devices to be connected to the network.

22. The system of claim 21, further comprising:

a power service unit connected to the system for supplying power received from the network T1 to the one or more system modules.

23. The system of claim 22, further comprising:

a bank controller unit connected to the system chassis for  
5 controlling the power service unit and the one or more system modules.

24. The system of claim 23, wherein the one or more system modules include dumb access modules, smart access modules, or a combination of both dumb and smart access modules.

25. The system of claim 24, wherein the bank controller unit provides  
10 network and fractional T1 control, access module control, alarm control, user interface control, and backplane control.

26. The system of claim 25, wherein the bank controller unit includes a field programmable logic array for providing clock generation, chip select, and backplane interface functions.

27. The system of claim 26, wherein the field programmable logic array is  
15 further operable to interface the bank controller unit with each access module using a serial peripheral interface located on the system backplane, provide timing generation in local, loop, and external timing modes, provide dialtone and ringback tone generation, multiplex backplane data with  
20 fractional T1 data, generate bit clock and byte clock data, and generate chip selects for the T1 interface transceiver, fractional T1 interface transceiver, and front panel LEDs and switches located on the system chassis.

28. The system of claim 27, wherein the access modules include

a bus transceiver connected to a module signaling bus for interfacing input/output ports on the access modules with a backplane bus on the system backplane; and

5 a bus control logic unit coupled to a control bus portion of the backplane for interfacing control signals generated by a processor on the bank controller unit with processor-controlled circuit components on each access module;

29. The system of claim 28, wherein:

10 each access module is operable to communicate a module identification code to the bank controller unit, and

the bank controller unit is responsive to the module identification code to automatically configure the system to provide access to the network T1 and allocate bandwidth to the customer premises device  
15 connected to each access module.

30. The system of claim 29, wherein the bank controller unit controls signaling modes, transmit attenuation, receive attenuation, and 2-wire line impedance for each access module.

31. The system of claim 30, wherein the bank controller unit  
20 communicates with smart access modules to determine access module type, timeslot, configuration, status, and test information for the smart access modules.